# CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Highway Materials Testing Laboratory)
An ISO 9001: 2008 Certified Company

JAS-ANZ ISO 9001:2000 CERTIFIED

Job No.: CQCE/BBMP/KTR/W.No.15/2017-18 06.03.2018

## Specific Gravity And Water Absorption Test

IS: 2386 Part III

| | |
|---|---|
| Client | **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore. |
| Agency | **Sri. K.T Ramesh,** Contractor, Bangalore. |
| Name of the Work | Improvements and Re-Asphalting of Road from 1st, 2nd, 3rd & 5th Cross Road Kempegowda Nagara in Dasarahalli Ward No.15, BBMP, Bangalore. |
| Source / Location | Hotmix Plant, Bangalore. |
| Type of Mix | Dense Graded Bituminous Macadam |
| Date of Testing | 06.03.2018 |

| Sl. No. | Details | Notation | Test Number | | | Mean Value |
|---|---|---|---|---|---|---|
| | | | Test 1 | Test 2 | Test 3 | |
| 1 | Weight of aggregate suspended in water with the basket | $W_1$ g | 2018 | 2020 | 2019 | |
| 2 | Weight of basket suspended in water | $W_2$ g | 753 | 753 | 753 | |
| 3 | Weight of saturated aggregate in water | $(W_1 - W_2) = W_s$ g | 1265 | 1267 | 1266 | |
| 4 | Weight of saturated surface dry aggregate in air | $W_3$ g | 2018 | 2016 | 2017 | |
| 5 | Weight of water equal to the volume of the aggregate | $(W_3 - W_S)$ g | 753 | 749 | 751 | |
| 6 | Weight of oven dried aggregate | $W_4$ g | 2009 | 2008 | 2007 | |
| 7 | Specific Gravity | $W_4/(W_3-W_S)$ | 2.668 | 2.681 | 2.672 | 2.670 |
| 8 | Apparent Specific gravity | $W_4/(W_4-W_S)$ | 2.700 | 2.710 | 2.709 | 2.704 |
| 9 | Water Absorption | $((W_3-W_4)*100)/W_4$ | 0.45% | 0.40% | 0.50% | 0.47% |

**Comments:**

→ Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

Note:

→ This test report should not be reproduced except in full, without written approval of the laboratory
→ The results indicated above are based on the tests carried out on the samples received in the laboratory
→ Any Query regarding the report must be reported within 15 days from the date of testing

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

Scanned by CamScanner

# CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Highway Materials Testing Laboratory)
An ISO 9001: 2008 Certified Company

JAS-ANZ
ISO 9001:2000 CERTIFIED

Job No.: CQCE/BBMP/KTR/W.No.15/2017-18

## BITUMEN CONTENT AND GRADATION DETERMINATION OF Dense Graded BITUMINOUS MACADAM MIX

AASHTO T 164 & AASHTO T 30

07.03.2018

| | |
|---|---|
| CLIENT | Executive Engineer, Dasarahalli Division, BBMP, Bangalore. |
| AGENCY | Sri. K.T Ramesh, Contractor, Bangalore. |
| NAME OF THE WORK | Improvements and Re-Asphalting of Road from 1st, 2nd, 3rd & 5th Cross Road Kempegowda Nagara in Dasarahalli Ward No.15, BBMP, Bangalore. |
| SAMPLE I/D | Sample Supplied by Agency |
| DATE OF TESTING | 07.03.2018 |

### BITUMEN CONTENT DETERMINATION

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before Test, g | 500 | 500 |
| 2. Weight of Mixture after Test, g | 482.5 | 482.5 |
| 3. Weight of Asphalt and Mineral matter Extracted, g | - | - |
| 4. Weight of Mineral Matter, g. | - | - |
| 5. Weight of Ash, g | | |
| 6. Weight of Bitumen Extracted, g. (corrected) | 17.5 | 17.50 |
| 7. Bitumen content in % | 3.50 | 3.50 |
| 8. Average | 3.50 | |

### GRADATION AFTER EXTRACTION

| SIEVE SIZE | Trail 1 | | | | JOBMIX |
|---|---|---|---|---|---|
| mm | Weight Retained, gm | % Retained | %Cummulative Retained | % Passing | Gradation |
| 26.5 | 0 | 0 | 0 | 100 | 100 |
| 19 | 35.62 | 7.38 | 7.38 | 92.62 | 90-100 |
| 13.2 | 157.21 | 32.58 | 39.96 | 60.04 | 56-88 |
| 4.75 | 163.52 | 33.89 | 73.85 | 26.15 | 16-36 |
| 2.36 | 49.27 | 10.21 | 84.07 | 15.93 | 4-19 |
| 0.3 | 46.31 | 9.60 | 93.66 | 6.34 | 2-10 |
| 0.075 | 9.9 | 2.05 | 95.72 | 4.28 | 0-8 |

| SIEVE SIZE | Trail 2 | | | | JOBMIX |
|---|---|---|---|---|---|
| mm | Weight Retained, gm | % Retained | %Cummulative Retained | % Passing | Gradation |
| 26.5 | 0 | 0 | 0 | 100 | 100 |
| 19 | 30.54 | 6.11 | 6.11 | 93.89 | 90-100 |
| 13.2 | 144.6 | 28.92 | 35.03 | 64.97 | 56-88 |
| 4.75 | 186.2 | 37.24 | 72.27 | 27.73 | 16-36 |
| 2.36 | 82.4 | 16.48 | 88.75 | 11.25 | 4-19 |
| 0.3 | 22.51 | 4.50 | 93.25 | 6.75 | 2-10 |
| 0.075 | 8.2 | 1.64 | 94.89 | 5.11 | 0-8 |

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory
- The results indicated above are based on the tests carried out on the samples received in the laboratory
- Any Query regarding the report must be reported within 15 days from the date of testing

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

Office & Laboratory : #

Scanned by CamScanner

# CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Highway Materials Testing Laboratory)
An ISO 9001: 2008 Certified Company

JAS-ANZ
ISO 9001:2000 CERTIFIED

Job No.: CQCE/BBMP/KTR/W.No.15/2017-18

Date: 09.03.2018

## TEST REPORT

| | | |
|---|---|---|
| CLIENT | : | **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore. |
| AGENCY | : | **Sri. K.T Ramesh,** Contractor, Bangalore. |
| NAME OF WORK | : | Improvements and Re-Asphalting of Road from 1st, 2nd, 3rd & 5th Cross Road Kempegowda Nagara in Dasarahalli Ward No.15, BBMP, Bangalore. |
| TYPE OF MIX | : | Bituminous Concrete |
| PERIOD OF TESTING | : | 09.03.2018 |

The results of the tests conducted on the Bitumen sample for Bituminous Concrete

| SLNo | Description | Test Method as per IS | Test Result | Requirement as per IS: 73-2013 |
|---|---|---|---|---|
| 1 | Penetration at 25$^0$C, 100g, 5 Sec 1/10 mm | IS: 1203-1978 (RA-2009) | 67 | 60 to 70 |
| 2 | Softening point, $^0$C | IS: 1205-1978 (RA-2009) | 50 | Min. 45 |
| 3 | Ductility at 27$^0$C, cm | IS: 1208-1978 (RA-2009) | 100 > | Min. 50 |
| 4 | Flash Point, $^0$C | IS: 1209-1978 (RA-2009) | 296 | Min. 220 |

Note:

⇒ This test report shall not be reproduced except in full, without written approval of the laboratory.
⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory.
⇒ Any Query regarding the report must be reported within 15 days from the date of testing.

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Scanned by CamScanner

Sh. [illegible] Bangalore. [illegible]

Name of the Work: Improvements and Re-Asphalting of Road from 1st, 2nd, 3rd & 5th Cross Road Kempegowda Nagara in Dasarahalli Ward No.15, BBMP, Bangalore.

Type of Mix: Bituminous Concrete

Date of Testing: 09.03.2018

Weight of Sample: 5000 gm

| SIEVE SIZE, mm | Weight Retained, gm | % Retained | Cummulative % Retained | % Passing | JOBMIX Gradation as per MORTH | Remarks |
|---|---|---|---|---|---|---|
| 19 | 0 | 0 | 0 | 100 | 100 | Gradation satisfies Bituminou concrete Gra specificatio per MORT |
| 13.2 | 521 | 10.42 | 10.42 | 89.58 | 79 - 100 | |
| 9.5 | 537 | 10.74 | 21.16 | 78.84 | 70 - 88 | |
| 4.75 | 606 | 12.12 | 33.28 | 66.72 | 53 - 71 | |
| 2.36 | 597 | 11.94 | 45.22 | 54.78 | 42 - 58 | |
| 1.18 | 634 | 12.68 | 57.90 | 42.10 | 34 - 48 | |
| 600 | 452 | 9.04 | 66.94 | 33.06 | 26 - 38 | |
| 300 | 437 | 8.74 | 75.68 | 24.32 | 18 - 28 | |
| 150 | 527 | 10.54 | 86.22 | 13.78 | 12 - 20 | |
| 075 | 321 | 6.42 | 92.64 | 7.36 | 4 - 10 | |

Weight of Sample: 5000 gm

| VE , mm | Weight Retained, gm | % Retained | Cummulative % Retained | % Passing | JOBMIX Gradation as per MORTH | Remarl |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 100 | 100 | Gradati satisfie Bitumin concrete G specificat per MO |
| 2 | 493 | 9.86 | 9.86 | 90.14 | 79 - 100 | |
| 5 | 532 | 10.64 | 20.50 | 79.50 | 70 - 88 | |
| 5 | 631 | 12.62 | 33.12 | 66.88 | 53 - 71 | |
| 5 | 567 | 11.34 | 44.46 | 55.54 | 42 - 58 | |
| 3 | 612 | 12.24 | 56.70 | 43.30 | 34 - 48 | |
| 0 | 472 | 9.44 | 66.14 | 33.86 | 26 - 38 | |
| 0 | 419 | 8.38 | 74.52 | 25.48 | 18 - 28 | |
| 0 | 532 | 10.64 | 85.16 | 14.84 | 12 - 20 | |
| 5 | 461 | 9.22 | 94.38 | 5.62 | 4 - 10 | |

est report should not be reproduced except in full, without written approval of the laborat
esults indicated above are based on the tests carried out on the samples received in the lab
uery regarding the report must be reported within 15 days from the date of testing.

For CIVIL QUALITY CONSULTANTS & EN

Authorised Signatory

Scanned by CamScanner

# CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Highway Materials Testing Laboratory)
An ISO 9001: 2008 Certified Company

JAS-ANZ
ISO 9001:2000 CERTIFIED

Lab No. CQCE/BBMP/KTR/W.No.15/2017-18 10.03.2018

## BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

| | |
|---|---|
| CLIENT | Executive Engineer, Dasarahalli Division, BBMP, Bangalore. |
| AGENCY | Sri. K.T Ramesh, Contractor, Bangalore. |
| NAME OF THE WORK | Improvements and Re-Asphalting of Road from 1st, 2nd, 3rd & 5th Cross Road Kempegowda Nagara in Dasarahalli Ward No.15, BBMP, Bangalore. |
| DATE OF TESTING | 10.03.2018 |

### BITUMEN CONTENT DETERMINATION

| Description | Sample 1 | Sample 2 |
|---|---|---|
| 1 Weight of Mixture before Test, g | 500 | 500 |
| 2 Weight of Mixture after Test, g | 469.5 | 470.5 |
| 3 Weight of Asphalt and Mineral matter Extracted, g | 30.5 | 29.5 |
| 4 Weight of Mineral Matter, g. | - | - |
| 5 Weight of Ash. g | - | - |
| 6 Weight of Bitumen Extracted, g. (corrected) | 30.5 | 29.5 |
| 7 Bitumen content in % | 6.10 | 5.90 |
| 8 Average | 6.00 | |

### GRADATION AFTER EXTRACTION

TABLE - 1

| SIEVE SIZE | Percent Passing, % | | JOBMIX |
|---|---|---|---|
| mm | Sample 1 | Sample 2 | Gradation |
| 19 | 100.00 | 100.00 | 100 |
| 13.2 | 90.34 | 92.34 | 79-100 |
| 9.5 | 77.25 | 76.34 | 70-88 |
| 4.75 | 57.32 | 58.34 | 53-71 |
| 2.36 | 44.21 | 46.92 | 42-58 |
| 1.18 | 36.29 | 37.51 | 34-48 |
| 0.6 | 32.51 | 32.64 | 26-38 |
| 0.3 | 28.64 | 26.47 | 18-28 |
| 0.15 | 17.23 | 16.84 | 12-20 |
| 0.075 | 8.24 | 7.52 | 4-10 |

**Note:**

⇒ This test report should not be reproduced except in full, without written approval of the laboratory

⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory

⇒ Any Query regarding the report must be reported within 15 days from the date of testing.

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

Scanned by CamScanner